

Issues in Identifying Contributors to Inventions under U.S. Law

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This chapter addresses inventorship and ownership issues, as may arise in a university or hospital setting. The chapter first defines inventorship and its legal background. Second, it addresses the complications that can arise when there are possible joint inventors and provides general guidelines for determining inventorship. Third, it describes the differences between inventorship and authorship. Fourth, it addresses the differences between inventorship and ownership. Finally, it discusses how to correct inventorship in the event of an error.

What Does it Take to be an Inventor?

Under U.S. law, only the first, original inventor(s) can obtain patent protection for an invention.¹ Inventorship is defined by statutory provisions of Chapter 35 of the U.S. Code (USC) as interpreted by case law. Despite these legal underpinnings, the process of determining inventorship is a very fact-specific endeavor. A first basic principle often misunderstood by inventors is that inventorship is determined in view of the claims at the end of a patent application that define the invention, not the content of the specification.

Once you understand the claims of a patent application, you review the process of invention in two parts: (1) conception and (2) reduction to practice. Conception is the key aspect for determining inventorship, i.e., to be an inventor, a person must make an intellectual contribution to the conception of the claimed invention.

In a 1994 biotechnology lawsuit, the Court of Appeals for the Federal Circuit took the opportunity to restate the long-standing principles of inventorship:

Conception is the touchstone of inventorship, the completion of the mental part of invention. It is “the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice.” Conception is complete only when the idea is so clearly defined in the inventor’s mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation. Because it is a mental act, courts require corroborating evidence of a contemporaneous disclosure that would enable one skilled in the art to make the invention.

Thus, the test for conception is whether the inventor had an idea that was definite and permanent enough that one skilled in the art could understand the invention; the inventor must prove his conception by corroborating evidence, preferably by showing a contemporaneous disclosure. An idea is definite and permanent when the inventor has a specific, settled idea, a particular solution to the problem at hand, not just a general goal or research plan he hopes to pursue. The conception analysis necessarily turns on the inventor’s ability to describe his invention with particularity. Until he can do so, he cannot prove possession of the complete mental picture of the invention. These rules ensure that patent rights attach only when an idea is so far developed that the inventor can point to a definite, particular invention.²

Conception is a mental act, but courts do not accept an inventor’s testimony alone to prove conception. Proof of conception requires corroborating evidence of a contemporaneous disclosure that is sufficient in scope and detail to enable one skilled in the art to make the invention.³ Thus, when you determine inventorship, it is important to have all potential inventors present laboratory notebook pages, charts, graphs, invention disclosure forms, e-mails, and any other documents that support their claim of inventorship. These materials should be collected and saved in the application file to support the decisions made on inventorship once the patent issues and for use during prosecution of the patent application or in litigation of the issued patent in the event it becomes necessary to prove dates of conception and/or reduction to practice.

The second part of the process of invention, reduction to practice, may be relevant to determining inventorship in that whether an individual is a co-inventor depends on whether his or her contribution constituted part of the conception or a mere reduction to practice. In this regard, one who does no more than reduce a completely conceived invention to practice is not an inventor.⁴ Reduction to practice can also become important if a date of invention must be proved, for example, in a declaration by the inventors to demonstrate a date of invention prior to the publication date of a reference published less than a year before the inventors' application filing date or in an interference proceeding.

Reduction to practice can be actual or constructive. An actual reduction to practice exists when, for example, a new device, composition, or machine is successfully made and tested, or a process is performed successfully. A constructive reduction to practice occurs when a patent application having a sufficient written description of the invention is filed, regardless of whether there has been an actual reduction to practice.

Conception and reduction to practice are normally, but not necessarily, distinct events separated in time. Nevertheless, courts have recognized for many years that simultaneous conception and actual reduction to practice can occur in some situations. For example, in *Smith v. Bousquet*, the Court of Customs and Patent Appeals (CCPA), a predecessor to the Federal Circuit, found conception and reduction to practice to be simultaneous. The CCPA explained, "we are in agreement with the views expressed by the Examiner of Interferences that the record in this case does not warrant a holding that either of the parties established conception ... prior to, or independent of, a reduction to practice."⁵ Elsewhere in its opinion, the CCPA quoted from the decision of the Examiner of Interferences (emphasis added):

[T]here is no known relation between chemical structure and insecticidal action, therefore, it is obviously impossible to predict or determine in advance of actual experiment whether or not any specific compound or group of compounds is a new and useful insecticide.

In the *experimental sciences of chemistry and biology the element of unpre-*

*dictability frequently prevents the conception separate from actual experimentation and test.*⁶

The doctrine of simultaneous conception and reduction to practice is alive and well, having been applied by the Federal Circuit in 1991 in *Amgen Inc. v. Chugai Pharmaceutical Co.*⁷ Regarding a claim to a “purified and isolated DNA sequence” encoding human erythropoietin (EPO), the Federal Circuit in *Amgen* stated, “[i]n some instances, an inventor is unable to establish a conception until he has reduced the invention to practice through a successful experiment. This situation results in simultaneous conception and reduction to practice.”⁸

In *Amgen*, the Federal Circuit linked its finding of simultaneous conception and reduction to practice to the unpredictability of cloning and sequencing genes:

[S]uccess in cloning the EPO gene was not assured until the gene was in fact isolated and its sequence known. Based on the uncertainties of the method and lack of information concerning the amino acid sequence of the EPO protein, the trial court was correct in concluding that neither party had an adequate conception of the DNA sequence until reduction to practice had been achieved⁹

Cases such as *Bousquet* and *Amgen*, however, do not stand for the proposition that, in an unpredictable art, someone who merely executes instructions and carries out experiments designed by the inventors to reduce an invention to practice becomes a co-inventor. Even though conception is not complete until the reduction to practice has occurred in this scenario, the person or persons who simply reduce the invention to practice based on the suggestion or instructions of others are not inventors.

Joint Inventorship: Who Are the True Inventors?

In many situations in academic or hospital settings, several people collaborate on a given research project. Are they all inventors? To answer this question, we start by looking to the law, which states that more than one person may contribute to the conception of an invention, thereby creating joint inventorship of that invention. Joint inventorship is

defined in 35 USC § 116 (2004), which provides in pertinent part:

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.

Thus, 35 USC § 116 provides three negative rules of joint inventorship. First, the inventors do not need to work together at the same physical location or at the same time. Therefore, the conception of the invention need not occur simultaneously amongst the joint inventors. Second, a person's contribution to the claimed invention must not be insignificant in quality and must do more than explain well-known concepts or the current state of the art (although no set type or amount of intellectual contribution is required).¹⁰ Third, a patent may issue with claims of a varying scope, such that each inventor need not make a contribution to the subject matter of every claim of the patent.¹¹

This sounds simple enough, but joint inventorship has been said to be “one of the murkiest concepts in the muddy metaphysics of patent law.”¹² In addition, the courts say that the determination of whether a person is a joint inventor is very fact-specific, with no bright-line standards sufficing for general use in every case.¹³ Nevertheless, if several individuals all assert that they should be named as inventors on a given patent application, you can use the following guidelines to help you to determine who contributed to the conception of the claimed invention.

First, despite the three negative rules provided in 35 USC § 116, there must be some minimum level of collaboration or connection between the joint inventors. On this issue, the Federal Circuit has stated:

The statutory word “jointly” is not merely surplusage. For persons to be joint inventors under § 116, there must be some element of joint behavior, such as col-

laboration or working under common direction, one inventor seeing a relevant report and building upon it or hearing another suggestion at a meeting. . . .

Individuals cannot be joint inventors if they are completely ignorant of what each other has done until years after their individual independent efforts. They cannot be totally independent of each other and be joint inventors.¹⁴

In other words, for joint inventorship there must be some evidence that information relating to conception of the invention was shared among the joint inventors. For example, one co-inventor's contribution to the conception may be shared with a second co-inventor more than one year prior to the second co-inventor's contribution without negating the conclusion that the parties were collaborating with one another.¹⁵

Second, as alluded to above, the contribution must be to the conception of the invention, not merely to the reduction to practice.¹⁶

Third, merely posing a problem to be solved or suggesting a desired result does not constitute inventorship.¹⁷ Thus, the head of a laboratory who poses a problem may not be an inventor if he or she has done nothing more. Similarly, one who merely funds the research of others, or provides laboratory space or materials, without more, is also not a co-inventor.

Fourth, merely following the instructions of others does not constitute invention.¹⁸ Thus, a researcher, e.g., a student, technician, or doctoral candidate, who is carrying out experiments designed or developed by his or her boss is not an inventor. Likewise, one who merely assists the actual inventor, without more, has not contributed to conception.¹⁹

Fifth, although a co-inventor's contribution may be relatively small compared to that of his or her co-inventor(s), the contribution must be "not insignificant in quality."²⁰ In some situations, a collaborator contributes to the conception of a minor point, but if that point merits inclusion in the claims, then the collaborator should be named as an inventor. On the other hand, if that minor point is covered in only one or a few claims, you may decide to omit those claims to exclude that collaborator from being listed as an inventor.

Sixth, once conception has occurred, the inventor may use the services, ideas, and aid of others in the process of perfecting an invention without diminishing his or her inventorship.²¹ On the other side of this issue, a person who supplies background data or general information does not, without more, become an inventor.²² Therefore, an inventor need not undertake all the steps necessary to reduce the invention to practice to be an inventor.²³

How are these guidelines applied in the following scenario? Assume that a laboratory technician or contract sequencer uses routine sequencing techniques to determine the sequence of a nucleic acid originally cloned by someone else. Is the technician a co-inventor on a claim to the sequenced nucleic acid? In the authors' view, the answer to this question is no, under a correct interpretation of the Federal Circuit's holding in *Fiers v. Revel*.²⁴

Of course, it is important to remember that, in this hypothetical, the person requesting the sequencing service has the clone in hand. In the *Fiers* case, Fiers did not. Fiers argued that his conception date was the date on which he had a workable *method for isolating the gene* (encoding beta-interferon). In denying Fiers the conception date, the Federal Circuit stated: "We conclude that the Board correctly decided that conception of the DNA of the count did not occur upon conception of a method for obtaining it."²⁵ Thus, the Federal Circuit in *Fiers* did not suggest that a technician who sequences a clone isolated by someone else is a co-inventor of claims to the nucleic acid sequence of that clone.

When Is an Author not an Inventor? Inventorship v. Authorship

An issue that often arises in a university or hospital setting is whether all of the authors of a journal article should be named as inventors of a patent application covering the subject matter of the article. As a general principle, inventorship on a patent (or patent application) and authorship on a research publication are two different things.

Understandably, this distinction is often lost on authors. It is not uncommon for a co-author on a journal article to be a thesis adviser, a colleague with whom general discus-

sions were held, a department or laboratory head, a graduate student, a technician or research collaborator who simply carried out instructions, or someone who supplied a component described in the article, e.g., an antibody, cell line, or nucleic acid vector. As discussed in detail above, such a co-author may or may not be a co-inventor, depending on what that co-author actually did and how the invention is defined in the claims.²⁶

At all times, it is incumbent upon you to be alert to inventorship issues. Although inventorship must be determined according to facts provided by the authors(s), the conclusion as to who among them is an inventor is a legal determination. You should always be prepared to provide to the authors a cogent explanation of the differences between inventorship and authorship, when the question arises.

When conducting in-house seminars or other training relating to patents, academic technology transfer offices should devote at least some time to a discussion of inventorship issues and the distinctions between inventorship and authorship determinations. Such a discussion will pay off in future avoidance of potential misunderstandings and discord among scientific colleagues and collaborators during the patenting process.²⁷ In addition, the final determination of inventorship can be assigned to outside counsel, who can then take the responsibility (and blame) for the decision, and deflect the potential anger of persons who were not named as inventors away from the technology transfer managers.

Who Owns my Invention? Inventorship v. Ownership

Inventorship and ownership of a patent can also be two different things. As a general rule, the named inventor is presumed to be the owner of the patent unless there is an assignment. As a result of this distinction, collaborative research between companies or between academic institutions, and between academic institutions and companies, can present difficult and complex patent considerations for inventorship as well as ownership.

Most academic institutions and companies require that employees assign to the institution or company all rights, title, and interest in inventions developed by the employee while an employee of the institution or company. Courts construe this obligation broadly and apply it to personnel who work at an institution, even if they are not exactly employ-

ees.²⁸ The Federal Circuit has found that assignment requirements can exist even in the absence of a signed contract.²⁹ As a result, a collaboration between two unrelated institutions raises issues as to ownership, because the collaborators, as inventors, will assign their rights to different entities.

Unless there is an agreement to the contrary, the rights of the several joint assignees of a patent are governed by 35 USC § 262, which provides in pertinent part:

[E]ach of the joint owners of a patent may make, use, offer to sell, or sell the patented invention within the United States, or import the patented invention into the United States without the consent of and without accounting to the other owners.

This means that one co-owner (or co-inventor) can sell the patented invention without having to pay anything to any other co-owner (or co-inventor). Similarly, one co-owner can grant a license to a company without the consent of the other co-owners and without having to give the other co-owners a share of the license royalties. It is important for an institution that has outside collaborations to consider ownership issues carefully, particularly when the institution is seeking to license the technology arising from such collaborations. A licensee may be less likely to take a license, or may offer a much lower royalty, if another co-owner has the ability to license the same technology to a competitor. Thus, all co-owners should consider contractual arrangements, e.g., interinstitutional agreements, to provide a consolidated front to potential licensees.

It is also important to consider the effect of research collaborations on inventorship in view of *Perceptive Biosystems v. Pharmacia Biotech*³⁰ In *Perceptive*, the district court concluded that the patent applicant had made a series of misrepresentations to the U.S. Patent and Trademark Office (USPTO) about a research collaboration, that the misrepresentations were material to inventorship and were designed to obfuscate the issue of correct inventorship, and that these misrepresentations constituted inequitable conduct before the USPTO. The Federal Circuit agreed. Thus, it is important for academic institutions and companies to be aware of research collaborations between their own inventors and third parties and properly characterize any such collaborations before the USPTO.

What if I Made a Mistake in Determining Inventorship?

If you catch an error in inventorship during prosecution of a patent application, you can correct this error under 35 USC § 116 if there was no deceptive intent in making the error. Section 116 states, in pertinent part:

Whenever through error a person is named in an application for patent as the inventor, or through an error an inventor is not named in an application, and such error arose without any deceptive intention on his part, the Director may permit the application to be amended accordingly, under such terms as he prescribes.

A simple petition that sets forth the facts, names the proper inventors, and asserts that there was no deceptive intention can be used to request the correction of inventorship under 37 CFR § 1.48.

Once a patent issues, the named inventors are presumed to be correct,³¹ and if the inventors named in a patent are incorrect, the patent is invalid. However, if an honest mistake was made in determining inventorship during prosecution of the application, all is not lost. In particular, if a court determines that there is clear and convincing proof of error, a patentee may invoke 35 USC § 256, entitled “Correction of Named Inventor,” to avoid patent invalidity.³² Section 256 states, in pertinent part:

Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Director may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

This section addresses two varieties of error in inventorship—misjoinder and nonjoinder. The first clause of § 256 addresses misjoinder, where a person who is not an inventor is listed incorrectly. The second clause addresses nonjoinder, where an inventor was not listed. The question is what types of errors permit correction in each of these two cases.

The Federal Circuit in *Stark v. Advanced Magnetics* held that the misjoinder clause does not contain the “without any deceptive intention” language found in the second clause, and, thus, the term *error* must include all varieties of mistakes—both honest and dishonest.³³

Therefore, 35 USC § 256 allows deletion of a misjoined inventor whether that error occurred by deception or by innocent mistake. On the other hand, the nonjoinder clause expressly refers to an error “without any deceptive intention” by the unnamed inventor (even if any of named inventors, even if incorrectly named, had a deceptive intent). In addition, 35 USC § 256 allows the addition of an unnamed actual inventor, as long as this nonjoinder was without any deceptive intent by that inventor. Interestingly, the Federal Circuit reads §116 as requiring a lack of deceptive intent in both cases of misjoinder and nonjoinder.³⁴

Thus, given the appropriate facts, the error of omitting inventors or naming incorrect inventors will not necessarily invalidate the patent in which the error occurred. Instead, after a hearing of all concerned parties, the court can order correction of the patent and the USPTO then issues a certificate correcting inventorship. Of course, if some of the named inventors are not true inventors, and intentionally deceived the USPTO, then the patent, though valid, may be unenforceable for inequitable conduct, but that is an issue for another chapter.

Notes

1. The rigid requirement that U.S. patents name the inventor(s) and only the inventor(s) has its roots in the U.S. Constitution. Art. I, Sec. 8, Cl. 8 provides that “inventors” are to have “the exclusive right to their ... discoveries.”
2. *Burroughs Wellcome Co. v. Barr Laboratories Inc.*, 40 F.3d 1223, 1227-1228, 32 USPQ2d 1915, 1919 (Fed. Cir. 1994) (citations omitted).
3. *Coleman v. Dines*, 754 F.2d 353, 224 USPQ 857 (Fed. Cir. 1985); *Mahurkar v. C.R. Bard*, 79 F.3d 1572 (Fed. Cir. 1996); *Price v. Symsek*, 988 F.2d 1187, 1195 (Fed. Cir., 1993).
4. *Sewall v. Walters*, 21 F.3d 411 (Fed. Cir. 1994).

5. *Smith v. Bousquet*, 111 F.2d 157, 162, 45 USPQ 347, 352 (CCPA 1940).
6. *Id.* at 159.
7. *Amgen Inc. v. Chugai Pharmaceutical Co.*, 927 F.2d 1200, 1206, 18 USPQ2d 1016, 1021 (Fed. Cir. 1991).
8. *Id.* at 1206.
9. *Id.* at 1207.
10. *Pannu v. Iolab Corp.*, 155 F.3d 1344, 47 USPQ2d 1657 (Fed. Cir. 1998); see also *Fina Oil and Chemical Co. v. Ewen*, 123 F.3d 1466 (Fed. Cir. 1997) (“Each inventor must contribute to the joint arrival at a definite and permanent idea of the invention as it will be used in practice.”) (quoting *Burroughs*).
11. *Ethicon Inc. v. United States Surgical Corp.*, 135 F.3d 1456, 45 USPQ2d 1545 (Fed. Cir. 1998).
12. *Mueller Brass Co. v. Reading Industries Inc.*, 176 USPQ 361, 372 (E.D. Pa 1972), *aff’d*, 180 USPQ 547 (3rd Cir., 1973).
13. *Fina Oil*, *supra* note 10 at 1473.
14. *Kimberly-Clark Corp. v. Proctor & Gamble Dist. Co. Inc.*, 973 F.2d 911, 23 USPQ2d 1921 (Fed. Cir. 1992).
15. *Pannu*, *supra* note 10.
16. The following Federal Circuit dictum in *Pannu* (155 F.3d at 1351) should not be read at face value (emphasis added): “All that is required of a joint inventor is that he or she (1) contribute in some significant manner to the conception *or reduction to practice* of the invention, (2) make a contribution to the claimed invention that is not insignificant in quality, when that contribution is measured against the full dimension of the full invention, and (3) do more than merely explain to the real inventors well-known concepts and/or the current state of the art.” If taken at face value and out of context, this statement might be interpreted as a statement that a significant contribution to reduction to practice can substitute for a significant contribution to the conception. Such has never been the law, and neither the context of *Pannu* nor the cases cited by the *Pannu* court suggest that the court intended the statement to be so read. The authors do not understand the intended meaning of the statement, and can only suggest that it may represent a typographical error or an editing oversight.

17. *Pro-Mold and Tool Co. v. Great Lakes Plastics Inc.*, 75 F.3d 1568 (Fed. Cir. 1996).
18. *Stern v. Tr. of Columbia Univ.*, 434 F.3d 1375 (Fed. Cir. 2006) (holding that a medical student who simply carried out experiments that the professor suggested did not contribute to conception of the invention); see also, Burroughs, *supra* note 2.
19. *Bd. of Educ. ex rel. Bd. of Trustees of Fla. State Univ. v. Am. Bioscience Inc.*, 333 F.3d 1330 (Fed. Cir. 2003).
20. *Pannu*, *supra* note 10 at 1351; see also *Mass. Eye and Ear Infirmary v. Novartis Ophthalmics Inc.*, 199 Fed. Appx. 960, 964, 2006 WL 2860587, 4 (Fed. Cir. 2006), in which a doctor claimed that he was a co-inventor because he suggested to the named inventors that the upper limit of their range for the claimed irradiance range should be 900mW/cm (not 1200mW/cm). The court found that his contribution to conception was not sufficiently significant, because his suggested limit was contained within the previously conceived broader range.
21. *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613 (Fed. Cir. 1985).
22. *Liebel-Flarsheim Co. v. Medrad Inc.*, 481 F.3d 1371 (Fed. Cir. 2007) (holding that attendance at “brain-storming sessions” was insufficient evidence to prove contribution to conception); *Hess v. Advanced Cardiovascular Systems Inc.*, 106 F.3d 976 (Fed. Cir. 1997).
23. *Idacon Inc. v. Central Forest Products Inc.*, 3 USPQ2d 1079 (E.D. Okla. 1986).
24. *Fiers v. Revel*, 984 F.2d 1164, 25 USPQ2d 1601 (Fed. Cir. 1993).
25. *Id.* at 1169.
26. *In re Katz*, 687 F.2d 450, 455 (C.C.P.A. 1982) (“[A]uthorship of an article by itself does not raise a presumption of inventorship with respect to the subject matter disclosed in the article. Thus, co-authors may not be presumed to be co-inventors merely from the fact of co-authorship.”)
27. See *Chou v. Univ. of Chicago*, 254 F.3d 1347 (Fed. Cir. 2001).
28. In *Regents of Univ. of N.M. v. Knight*, 321 F.3d 1111 (Fed. Cir. 2003), a faculty staff member without an employment contract was bound by an implied contract from the university’s patent policy, which was contained in the Faculty Handbook, to assign all inventions to the university. Similarly, in *Univ. of W. Va. Bd. of Tr. v. Vanvoorhies*, 278 F.3d 1288 (Fed. Cir. 2002), the court concluded that a graduate student was obligated to assign an invention to the university under its policy that provides the university owns all inventions made by university personnel or made with substantial use

of university resources.

29. *Chou*, supra note 27 (finding that a university's patent policy obligated a graduate student to assign her inventions to the university even though she never signed a contract mandating such an assignment).
30. *Perseptive Biosystems Inc. v. Pharmacia Biotech Inc.*, 225 F.3d 1315, 56 USPQ2d 1001 (Fed. Cir. 2000).
31. *Amax Fly Ash Corp. v. U.S.*, 514 F.2d 1041 (Ct. Cl. 1975).
32. *Checkpoint Sys., Inc. v. All-Tag Sec. S.A.*, 412 F.3d 1331 (Fed. Cir. 2005); see also *Stark v. Advanced Magnetics, Inc.*, 119 F.3d 1551, 1556 (Fed. Cir. 1997).
33. *Stark* at 1554.
34. *Id.* at 1555.